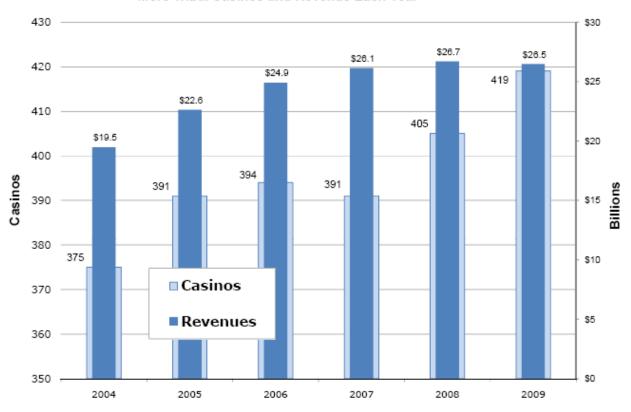
Tribal Casino Pollution Prevention BEST MANAGEMENT PRACTICES/P2 RESOURCE LIST



Introduction

There are more than 400 gaming facilities in the U.S. and the number and collective size of the industry has increased steadily in recent years. The hospitality and gaming industries are resource-intensive operations and generate many waste streams from the multi-function facilities. Consequently, tribal casinos often have a large "environmental footprint."

More Tribal Casinos and Revenue Each Year



National Indian Gaming Commission http://www.nigc.gov/LinkClick.aspx?fileticket=1k4B6r6dr-U%3d&tabid=67

The large and growing tribal casino sector consume large amounts of resources and generate many wastes – tribes increasingly are focusing effort on reducing their environmental footprint and in the process operating more efficiently and cost-effectively. In the following sections, the best management practices (BMPs) for tribal casinos are divided into four categories: (1) solid waste, (2) water use/wastewater generation, (3) energy use, and (4) hazardous materials/hazardous waste. The BMPs encompass operations and activities associated with the casinos, lodging, and dining.

Solid Waste

According to a California waste study, commercial industry collectively generates about half of the state's disposed waste stream

Primary Sources/Waste Streams

- Food preparation
- Food packaging
- Hospitality items
- Office paper, newspapers, phone books and directories
- · Construction and demolition (C&D) waste
- Beverage containers
- Shipping/receiving material (cardboard, plastic, pallets, etc.)
- Fluorescent Lamps

Waste Characterization

Hotels/Lodging Waste Generation:

- 5,049 pounds of waste/employee/year with less than 25% diverted
- 97 lbs/cubic yard (CIWMB. 2006. Targeted Statewide Waste Study Large Hotels:

www.calrecycle.ca.gov/Publications/default.asp?pubid=1184).

- 35 45% of municipal solid waste is from commercial sources (*EcoPurchasing Guide for Hotels and Motels*, 1993, University of Fla.)
- Restaurants: 1 lb/seat/day, 17 lb/employee/day
 Hotels: 2-4 lbs/room/day of solid waste (various CA studies www.ciwmb.ca.gov/WasteChar/WasteGenRates/Service.htm)

Solid Waste Composition

Hotels/Lodging Waste Composition:

Component	CIWMB-2006 ¹	Mohegan -19972 ²
Food/organics	45.3%	37.5%
Grease		1%
Cardboard	6.8%	7%
Glass bottles and containers	5.3%	4.5% ("commingled
Metal	3.1%	recyclables")
Paper	33.2%	50%
Plastic	7.8%	("trash")
C&D (Const & Demo)	5.0%	
Other	0.3%	
	100%	100%

¹ CIWMB. 2006. Targeted Statewide Waste Study – Large Hotels www.calrecycle.ca.gov/Publications/default.asp?pubid=1184).



² EPA. April 2000. Waste Reduction Tips for Hotels/Casino in Indian Country. www.epa.gov/epaoswer/non-hw/tribal/pdftxt/casinotips.pdf

BMPs/P2 Opportunities

General for Casinos – Solid Waste and Recycling:

U.S. Environmental Protection Agency. *Waste Reduction Tips for Hotels and Casinos in Indian Country.*

www.epa.gov/wastes/wycd/tribal/pdftxt/casinotips.pdf

Food Waste:

As hospitality venues, casinos prepare and serve food in multiple locations including restaurants, worker cafeterias, and hotel room service. Food service is often the largest casino function after gaming, and typically offer patrons food during most, if not all parts of the day and night. The largest component of the waste stream from food service is organic materials including food trimmings, post-consumer waste (e.g., plate scrapings), and disposable paper containers, and napkins.

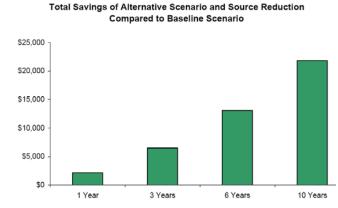
Restaurants generate about 1 pound/seat/day or 17 pounds/employee/day of solid waste of which 37% is food waste. (CalRecycle, *Estimated Solid Waste Generation Rates for Service Establishments*.

www.ciwmb.ca.gov/WasteChar/WasteGenRates/Service.htm

EPA Food Waste Management Cost Calculator,

www.epa.gov/wastes/conserve/materials/organics/food/tools/index.ht
 m: EPA developed this Microsoft Excel spreadsheet to help organizations estimate and compare the costs of alternatives to food

waste disposal. The spreadsheet allows the user to input data specific to their circumstances including access to composting and kitchen grease vendors, and waste costs and calculates savings over multiple time periods (see example at right).



Green Seal GS-46, Standard for Restaurant and Foodservice Operations,

www.greenseal.org/certification/standards/gs46 restaurantfoodsvcs.cf m: Green Seal established GS-46 to delineate environmental standards for restaurants and food service operations for a variety of "key impact areas" including food waste. GS-46 identifies levels of environmental performance with specific goals and best practices. Particularly useful are the tools associated with the standard including a Waste Reduction and Management Plan to log food waste accomplishments in each standard requirement.

 CalRecycle, <u>www.calrecycle.ca.gov/Publications/default.asp?cat=20</u>: California's guide to minimizing food waste from restaurants provides an overview and tips for each point of food waste generation from purchasing, handling and storage, preparation, and serving.

Recyclables:

- Formalize a Recycling Program with staff training, data tracking, and auditing (EPA provides an overview of implementation steps. www.epa.gov/osw/conserve/rrr/recycle.htm
- Where available, maximize use of municipal or commercial recycling programs; many offer free containers and pickup of recyclables and some allow commingling of recyclables. Diverting recyclables and compostables can reduce costs associated with landfill disposal of solid waste disposed.
- WasteWise: Consider joining this free, voluntary EPA program through which organizations eliminate costly municipal solid waste, benefiting their bottom line and the environment.
 www.epa.gov/epawaste/partnerships/wastewise/about.htm
- Recycle paper products, cardboard, glass, plastic, and metals.
 Commonly recyclable materials:
 www.epa.gov/osw/nonhaz/municipal/pubs/bus-guid/app-e.pdf
- Identify special waste streams that can be recycled, such as batteries, electronics, and fluorescent lamps. WasteWise electronics reuse and recycling: www.epa.gov/epawaste/inforesources/pubs/infocus/rif-c&d.pdf
- Set up a paper recycling program: <u>www.epa.gov/waste/conserve/materials/paper/setting/schoolwork.ht</u> m#offices

C&D - Carpeting:

- Environmentally preferable purchasing of carpet (U.S. EPA. 2006. Carpet Resources.
 - <u>www.epa.gov/opptintr/epp/pubs/products/carpets.htm</u>). Green Seal offers a list of recommended carpet brands that manufacture and sell environmentally responsible consumer carpets.
- Carpet reclamation (U.S. Environmental Protection Agency. 2006. Carpet Resources.
 www.epa.gov/opptintr/epp/pubs/products/carpets.htm

Greenhouse Gas Reductions

Solid waste generation, disposal, and breakdown have large implications on greenhouse gas (GHG) emissions. Tribal casinos can calculate the GHG effect of their solid waste reduction and diversion efforts using various methodologies.

EPA created the Waste Reduction Model (WARM, http://epa.gov/climatechange/wycd/waste/calculators/Warm_home.html) to help solid waste planners and organizations track and voluntarily report GHG emissions reductions from several different waste management practices. WARM calculates and totals GHG emissions of baseline and alternative waste management practices - source reduction, recycling, combustion, composting, and landfilling. The model calculates emissions in metric tons of carbon equivalent (MTCE), metric tons of carbon dioxide equivalent (MTCO2E), and energy units (million BTU) across a wide range of material types commonly found in municipal solid waste.

Hazardous Material/Hazardous Waste

Primary	Janitorial chemicals
Sources/Waste	Building maintenance chemicals
Streams	Construction/Demolition wastes (asbestos and lead)
	Vehicle maintenance (hazardous chemicals, fuels, used oil, etc.)
	Fertilizers and pesticides
Waste Characterization	 Janitorial - 1/3 of cleaning chemicals used today have harmful ingredients (Western Regional Pollution Prevention Network. Janitorial Products – Pollution Prevention Project. <u>www.westp2net.org/Janitorial/workshop.cfm</u> Building Maintenance – metal cleaners, glass cleaners, aerosol solvents, etc. Vehicle Maintenance – brake cleaners, solvent parts washers, used oil,
	cleaners, used oil filters, etc.
BMPs/P2	Janitorial products P2:
Opportunities	Using green cleaning products in janitorial services offers better environmental performance and improved worker health and safety, while retaining the same sanitation quality as traditional, more chemical-intensive methods.
	 EPA has outlined various approaches and tools for "Greening Your Purchase of Cleaning Products for Federal agencies casinos can use for their operations including various tools, resources, and purchasing guides. www.epa.gov/epp/pubs/cleaning.htm#pts EPA has defined environmental attributes for cleaners: www.epa.gov/epp/pubs/products/cleanattribut.htm Green Seal has developed standards for various cleaning products including general-purpose, restroom, glass, and carpet cleaners, for routine cleaning of commercial, office, and industrial facilities: www.greenseal.org/certification/cleaning_products.cfm Case Study - Greening the Chumash Casino Resort: www.epa.gov/region09/waste/tribal/pdf/Greening-Tribal-Casino-Operations-SantaYnez.pdf
	Vehicle maintenance P2:
	 EPA Region 9 conducted a comprehensive review of chemical products used in vehicle maintenance facilities and prepared numerous factsheets, case studies, and videos outlining P2 techniques and technologies. www.epa.gov/region09/waste/p2/autofleet/index.html Many vehicle maintenance fluids can be recycled, including used oil, transmission and brake fluid, and antifronze.
	transmission and brake fluid, and antifreeze.
	 Integrated Pest Management (IPM): IPM reduce the use of pesticides, an approach that relies primarily on
	non-chemical means such as controlling climate, food sources, and building entry points to prevent and manage pest infestation. www.epa.gov/osw/wycd/tribal/pdftxt/casinotips.pdf
	Landscape with indigenous plants adapted to the local climate and rain patterns to reduce the need for additional chemical application.

- GreenScapes: www.epa.gov/greenscapes
- Large scale landscaping: www.epa.gov/epawaste/conserve/rrr/greenscapes/lrgscl.htm
- The Sustainable Sites Initiative: www.sustainablesites.org/
- Landscaping with Native Plants: www.epa.gov/greenacres/
- Integrated Pest Management Plan Factsheet: www.epa.gov/opp00001/factsheets/ipm.htm

Hazardous Waste:

- Batteries: <u>www.epa.gov/osw/conserve/materials/battery.htm</u>
- Hazardous Waste Recycling: www.epa.gov/osw/hazard/recycling/index.htm
- Universal Waste: Steps to Managing your Universal Waste Lamps in an Environmentally-Safe Manner: www.epa.gov/osw/hazard/wastetypes/universal/lamps/recycle.htm

Water Use/Wastewater Generation

Primary Sources/Waste Streams

- Landscaping
- Bathroom fixtures
- Food Service
- Building Operation/Physical Plant

Water Use

- The average water usage per occupied room per day is 218 gallons (University of Florida, Cooperative Extension Service and Energy Extension Service. *EcoPurchasing Guide for Hotels and Motels*. www.p2pays.org/ref/02/01784.pdf)
- Water consumption in the hospitality industry (Hagler Bailly Services, Inc., Bill Meade and Patricio Gonzalez-Morel. Improving Water Use Efficiency in Hotels and Resorts Through the Implementation of Environmental Management Systems.
 www.ucowr.siu.edu/updates/pdf/V115_A6.pdf)

Water efficiency benchmarks (International Hotels Environmental Initiative)

Water use rating (figures are in US Property gallons/guest night) size Good Poor Very poor Fair < 50 116 - 134 134 - 154 < 116 > 154 rooms 50 - 150< 154 154 - 178 178 - 213 > 213 rooms > 150 176 - 226 < 176 226 - 259 > 259 rooms

Water Use Distribution in Hotels:

Water Use Area	Hagler Bailly
Guest Rooms	33%
Kithcens/Coldrooms	18%
Landscaping	15%
Public Bathrooms	15%
Laundry	11%
Building Operation	5%
Pool	3%
	100%



BMPs/P2 Opportunities

WaterSense, <u>www.epa.gov/watersense</u> is a voluntary partnership program operated by EPA that promotes water efficiency and supports implementation of product and practices that conserve water including at commercial facilities such as casinos. By adopting and promoting water-efficient products, services, and practices, water users can greatly reduce annual water and energy costs, as well as help reduce the stress on natural resources. www.epa.gov/WaterSense/spaces/ci.html

Bathroom Fixtures:

 Water saving bathrooms (faucets, toilets, urinals, showers, etc.) use only a fraction of the water required by older, less efficient fixtures. Casinos bathrooms often experience heavy customer usage and can operate 24 hours a day, 7 days a week. EPA provide WaterSense labeling based on third-party testing to meet EPA's specifications for water efficiency and performance. A list of qualified products is available at www.epa.gov/WaterSense/products/index.html.

Landscaping:

- Landscape with indigenous plants adapted to the local climate and soil conditions to reduce the need for superfluous water application.
- Use recycled water for landscaping.
- Use composted mulch to retain soil moisture, control weeds, and reduce water use. Mulching is placing organic matter over the root zone of plants and trees and conserves water by reducing moisture evaporation from the soil and weed populations. (U.S. Environmental Protection Agency. Environmentally Beneficial Landscaping Learning to Balance Our Needs with Those of Future.
 www.epa.gov/region02/ff/ebl.pdf)

Food Service:

- Water efficient dishwashers
- Sink aerators
- Others

Building Operation/Physical Plant:

• Condensate reuse on steam boilers



Energy Use

Primary • Heating/Ventilation/Air Conditioning (HVAC)	Heating/Ventilation/Air Conditioning (HVAC)			
Strame • Kitchens	Kitchens			
Streams • Lighting (casino)				
Lighting (hotel and restaurants)				
Building Operation (elevators, security system	ns, AV equipment, etc.)			
Btu/sq.ft./year) as the average large hospital	Casinos can use 5+ times as much energy per square foot (1,200,000 Btu/sq.ft./year) as the average large hospital (EnergyServices. March 2006. Casino Energy Management Fact Sheet. www.wapa.gov			
Breakdown of energy consumption in the hosy (Energy and Environment Benchmark for Hotel Engineering).				
Space heating 31%				
Water heating 17%				
Cooling 15%				
Lighting 20%				
Kitchen 10%				
Elevators 3%				
Other 4%				
Total 100%	•			
 Laundering within the hospitality industry con total hotel electricity (Energy and Environmen Industry. 2006. Laundry). 				
BMPs/P2 Lighting :				
energy efficient lamps/ballasts, etc.); Energy				
	 Institute policy of using compact fluorescents (CFL) throughout facility (casino, dining, meeting space, and lodging) instead of incandescent 			
Slot Machines:	Slot Machines:			
LED lamps, which can be a 50% savings rathe LED lamp retrofit kits are available, which are	 Replace existing fluorescent lamps with longer lasting and more efficient LED lamps, which can be a 50% savings rather than standard light bulbs. LED lamp retrofit kits are available, which are direct replacements of the fluorescent lamps and eliminate the fluorescent ballast. 			
Heating, Ventilation, and Air Conditioning:				
Pollution Prevention Resource Exchange. 2006	 Maintain HVAC efficiency through monitoring and maintenance (The Pollution Prevention Resource Exchange. 2006. Hospitality: Operations. www.p2rx.org/topichubs/subsection.cfm?hub=14&subsec=2&nav=2 			
Install onsite energy generation or purchase generation.				

Environmental Protection Agency. 2006. Green Power Partnership. Buy Green Power. www.epa.gov/greenpower/buygp/index.htm

Hot Water Heaters/Boilers:

- Insulate all hot water pipes to maximize efficiency (Wisconsin Focus on Energy. 2006. *Controlling Energy Costs in Lodging Business Fact Sheet.* www.focusonenergy.com/business/commercial-business/hotels/
- Set hot water heaters used for domestic use no higher than 120 °F.
- Typically the hot water used for washing linens must be hotter than the
 water routed to individual lodging rooms, in order for the detergents and
 bleaches to be effective. Separate the hot water heaters that service the
 laundry washing machines from the lodging rooms, so that they can be
 set at different temperatures.

Swimming Pools/Hot Tubs:

- Only operate outdoor heated pools during the warm season and consider complete shutdown during off-peak season (only operating pump to circulate pool chemicals).
- Use an insulating pool cover after hours and during off season.
- Replace existing single-speed circulating pumps with variable-speed pumps.

Vendor information: www.pentaircommercial.com/

Energy savings calculator:

www.pentaircommercial.com/selectionguide/index.html

Appliances:

- Replace existing equipment with Energy Star rated appliances and machines.
- Maintain appliances and perform regular cleaning of cooling and heating elements/coils.
- Conduct cost/benefit analysis of appliances more than 10 years old including us of energy company rebates.

Energy Calculators:

EPA's Energy Star program provides energy calculators for numerous types of equipment to help make informed decisions about energy costs, www.energystar.gov/index.cfm?c=bulk_purchasing.bus_purchasing.

- Clothes Washers
- Food Service Equipment: dishwashers, fryers, griddles, hot food cabinets, ice machines, ovens, refrigerators and freezers, steam cookers, and vending machines.
- Heating and Cooling Products
- Construction Products
- Consumer Electronics
- Office Products



Case Studies

Mohegan Sun Resort	 (TribalP2 Project Resources. Mohegan Tribe and Mohegan Sun Resort. 2004. Visionary Planning for the Seventh Generation. www.tribalp2.org/resourcequery.php?group=project_type&searc hby=resourcecategory_id&id=4&label=casinos www.p2pays.org/ref/37/36109.pdf) 3rd largest casino in the United States Focused P2 effort on energy use, transportation, and food service Send more than 2,190 tons of food waste to a piggery each year Model of saving money through energy and resource conservation Fuel cell technology Photovoltaics Heat pumps Infrared sensors for heating and lighting Recycling More than 44% of the solid waste stream is recycled
Chumash Casino Resort	Greening the Chumash Casino Resort:
Santa Ynez, California	www.epa.gov/region09/waste/tribal/pdf/Greening-Tribal-Casino-
	Operations-SantaYnez.pdf
	Parking structure storm water collection Cray water rouse.
	Gray water reuseLow flow bathroom fixtures
	Variable frequency drives
	 Energy efficient projects: air hand dryers, slot machine LEDs, energy management software
	Green cleaning program: Green Seal certified cleaners, microfiber mops
	Source separation and recycling
	Customer and employee biodiesel shuttle buses
Eastern Band of Cherokee Indians of North Carolina, 1	www.tribalp2.org/resourcequery.php?group=project_type&searc hby=resourcecategory_id&id=4&label=casinos
casino and 3 restaurants	Composting program for wastewater treatment sludge,
	vegetative waste, and food wasteCollects approximately 1,200 lbs. of food waste per day and
	final product is distributed to landscapers, nurseries, and individual homes
Philadelphia's Sheraton	Greene-e. July 2002. Philadelphia's Sheraton Rittenhouse Square
Rittenhouse Square Hotel	Hotel "Warms Up" to Green Power.Purchases 20,000 kilowatts a month of wind power, which
	represent 8% of the hotel's total electricity consumption
	Replaced incandescent light fixtures with compact
	fluorescents and saved 78% in energy costs (Building Design and Construction. November 2006. <i>Green Buildings and the Bottom Line</i>)

Disney World, Florida	Hotel Online Special Report, Ishmael Mensah. May 2004. Environmental Management Practices in US Hotels. www.hotel-online.com/News/PR2004_2nd/May04_EnvironmentalPractices.html) Recycles 4 million gallons per day of wastewater for irrigation of landscaping and golf courses
Habitat Suites Hotel in Austin, Texas	ļ , ,